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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/081,219	02/22/2002	Dennis A. Corrigan	OBC-104	1673

7590

04/18/2003

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EXAMINER

TSANG FOSTER, SUSY N

ART UNIT

1745

PAPER NUMBER

7

DATE MAILED: 04/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/081,219

Applicant(s)

CORRIGAN ET AL.

Examiner

Susy N Tsang-Foster

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24,27,28,31-33,38,41,42 and 45-57 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24,27,28,31,32,38,41,42,45-51 and 53-57 is/are rejected.
- 7) ☒ Claim(s) 33 and 52 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. This Office Action is responsive to the amendment filed on 1/30/2003. Claims 1-23, 25, 26, 29, 30, 34-37, 39, 40, 43, and 44 have been cancelled. Claims 24, 27, 28, 31-33, 38, 41, 42, 45, and 46 have been amended, and claims 47-57 have been added. After further consideration by the Examiner, the indication of allowable subject matter for claims 24, 27, 28, 31-32, and 47-51 in the previous Office Action is withdrawn. The indication of allowable subject for claims 38, 41, 42, 45, 46, and 53-57 is withdrawn in view of newly discovered prior art during an update of the search. Claims 33 and 52 are objected to and contain allowable subject matter. Claims 24, 27, 28, 31, 32, 38, 41, 42, 45-51 and 53-57 are rejected for reasons given below.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 38, 41, 42, 45, 46, and 53-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamezane et al. (US 6,187,473 B1) in view of Yang et al. (US 6,461,762 B1).

Tamezane et al. disclose a rechargeable electrochemical cell comprising an electrode stack including a positive electrode comprising nickel hydroxide and a negative electrode

Art Unit: 1745

comprising a hydrogen storage alloy where the positive electrode and the negative electrode are spirally rolled up through a separator made of unwoven polypropylene which is hydrophobic (col. 4, lines 30-45, col. 6, lines 50-65; Figure 4). The electrolyte in the electrochemical cell is aqueous KOH (col. 7, lines 30-43).

Tamezane et al. do not disclose that the electrode stack includes a first electrode disposed between a first and a second counter-electrode with the electrode stack folded in a zigzag configuration having folds and creases and the first electrode is the positive electrode or the negative electrode and the counter-electrode is the positive electrode or the negative electrode.

Yang et al. teach a rechargeable electrochemical cell comprising an electrode stack including a first electrode disposed between a first and a second counter-electrode, the electrode stack folded in a zigzag configuration with folds and creases and the first electrode can be either a positive electrode or a negative electrode and the first and second counter-electrode can be a positive electrode or a negative electrode and an electrochemical cell having this folded configuration has a smaller dead volume and increased energy density in the battery than a spiral coiled electrochemical cell stack in an electrochemical cell (see Figures 2, 3, 5; col. 1, lines 1-54, col. 3, lines 14-35, and col. 4, lines 44-55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the electrochemical stack configuration in the battery of Tamezane et al. to be a first electrode disposed between a first and a second counter-electrode, the electrode stack folded in a zigzag configuration with folds and creases and the first electrode can be either a positive electrode or a negative electrode and the first and second counter-electrode can be a positive electrode or a negative electrode because an electrochemical cell having this folded

Art Unit: 1745

configuration has a smaller dead volume and increased energy density in the battery than a spiral coiled electrochemical cell stack in the rechargeable electrochemical cell.

4. Claims 24, 27, 28, 31-33, and 47-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fauvarque (US 5,569,559) in view of Shackle (US 5,300,373).

Faurvarque discloses an alkaline cell where the negative electrode can be a hydride type which is a hydrogen storage alloy and the positive electrode can be nickel hydroxide (col. 6, lines 53-61 and col. 7, lines 49-60) where an aqueous alkaline solid polymer electrolyte which is viscoelastic at ambient temperature is used between the positive electrode and the negative electrode (Figure 5, col. 2, lines 39-45 and col. 10, lines 47-57). The electrolyte can be impregnated into a conventional nonwoven separator made of polyolefin which is a hydrophobic material as seen in Figure 5 (col. 8, lines 23-27 and col. 9, lines 15-20).

Faurvarque does not disclose that the electrochemical cell includes a stack having a first electrode folded in a zigzag configuration having folds and creases and at least one bifold counter-electrode having a first leg and a second leg where the first leg and the second leg are disposed within a first and a second fold on the same side of the zigzag configuration of the first electrode.

Shackle teaches an electrochemical cell stack that is made from a continuous laminate web including an electrode layer, a polymer electrolyte layer, and a plurality of discrete opposite polarity electrode bifolds (segments) where the first and second legs of each bifold are disposed on the same side of the zigzag configuration where the laminate is folded in a zig zag (fan-folded) such that substantially the entire surface area of the opposite polarity electrode bifolds (segments) are in contact with the electrolyte layer and in ion exchange with the electrode layer

Art Unit: 1745

(see abstract, Figures 6A, 6B, 7A, 7B, 11A, 11C, 12A-12C, 13A-13C; col. 1, lines 5-53).

Shackle also teaches that this configuration of the electrochemical cell stack can be quickly assembled to obtain the desired power characteristics obtained by controlling the area for ion exchange between the anode and cathode by varying the number of electrode bifolds of the opposite polarity in the electrochemical cell stack (col. 7, lines 35-58).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the cell of Faurvarque be in the configuration of the electrochemical cell of Shackle as discussed above because an electrochemical cell having a first electrode folded in a zigzag configuration having folds and creases and at least one bifold counter-electrode having a first leg and a second leg where the first leg and the second leg are disposed within a first and a second fold on the same side of the zigzag configuration of the first electrode allows for quick assembly of the electrochemical cell where the desired power characteristics of the cell can be easily obtained by varying the number of electrode bifolds of the opposite polarity in the electrochemical cell stack which varies the area for ion exchange between the first electrode and the counter-electrode.

Allowable Subject Matter

5. Claims 33 and 52 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. Any inquiry concerning this communication or earlier communications should be directed to examiner Susy Tsang-Foster, Ph.D. whose telephone number is (703) 305-0588. The examiner can normally be reached on Monday through Thursday from 9:30 AM to 8:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at (703) 308-2383. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900.

The fax phone numbers for the organization where this application or proceeding is assigned is (703) 872-9310 for regular communications and (703) 872-9311 for After-Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

st/9 April 2003

Susy Tsang-Foster